WHAT IS CLAIMED IS:

1. An image input/output control apparatus for performing input/output of image data with an external apparatus, comprising:

control means for controlling the input/output of the image data with the external apparatus;

plural image processing means for performing predetermined image processes to the image data; and

plural data transfer means for connecting each of said plural image processing means and said control means like a ring and performing data transfer,

wherein each of said plural image processing means and said control means are composed respectively on different units.

2. An apparatus according to Claim 1, wherein said control means performs processing setting for said plural image processing means through said data transfer means, and said plural image processing means perform the processes on the basis of the processing setting.

3. An apparatus according to Claim 2, wherein said plural image processing means connect with the external apparatus and perform the input/output of the image data with said external apparatus on the basis of the processing setting by said control means.

4. An apparatus according to Claim 1, wherein

said control means includes first generation means for generating a command packet in which a header including discrimination information to discriminate to which of said plural image processing means the processing setting should be performed is added to command data including processing information to perform the processing setting for said plural image processing means,

said plural image processing means include first packet control means for analyzing the header of the input command packet and controlling the process concerning the input command packet based on the discrimination information described on the header, and

said data transfer means transfers the command packet.

5. An apparatus according to Claim 4, further comprising:

second generation means for generating a data packet in which a header including discrimination information to discriminate by which of said plural image processing means the process should be performed is added to rectangular image data having a predetermined size; and

second packet control means for analyzing the header of the input data packet and controlling the

process concerning the input data packet based on the discrimination information described on the header,

wherein said data transfer means transfers the data packet.

6. An image processing apparatus comprising:

plural image processing means for performing predetermined image processes to image data;

first generation means for generating a command packet in which a header including discrimination information to discriminate to which of said plural image processing means processing setting should be performed is added to command data including processing information to perform the processing setting for said plural image processing means;

packet transfer means for connecting each of said plural image processing means and said first generation means and performing packet transfer,

wherein said plural image processing means analyze the header of the input command packet and control the process concerning the input command packet on the basis of the discrimination information described on the header.

7. An apparatus according to Claim 6, wherein said plural image processing means perform control so that said command packet is output, if the

discrimination information of said command packet is uncoincident with own discrimination information, and perform control so that internal processing setting is performed according to the command data of said command packet, if the discrimination information of said command packet is coincident with own discrimination information.

8. An apparatus according to Claim 6, further comprising:

second generation means for generating a data packet in which a header including discrimination information to discriminate by which of said plural image processing means the process should be performed is added to rectangular image data having a predetermined size,

wherein said packet transfer means transfers the data packet between each image processing means and said second generation means, and

said plural image processing means analyze the header of the input data packet and control the process concerning the input data packet on the basis of the discrimination information described on the header.

9. An apparatus according to Claim 8, wherein said plural image processing means perform control so that said data packet is output, if the discrimination

information of said data packet is uncoincident with own discrimination information, and perform control so that internal processes based on the rectangular image data of said data packet are performed, if the discrimination information of said data packet is coincident with own discrimination information.

10. An apparatus according to Claim 8, wherein said packet transfer means connects each of said plural image processing means, said first generation means and said second generation means like a ring.

11. An apparatus according to Claim 10, wherein each of said plural image processing means and said first generation means are composed respectively on different units.

12. An apparatus according to Claim 6, wherein said plural image processing means connect with an external apparatus and perform input/output of image data with the external apparatus on the basis of the processing setting by said command packet.

13. An image input/output control apparatus comprising:

control means, connected to a memory for storing image data, for controlling input/output of the image

data performed with an external apparatus;

first image processing means, connected to an image output apparatus, for performing a predetermined image process to image data to be output by said image output apparatus, on the basis of processing setting information sent from said control means;

second image processing means, connected to an image input apparatus, for performing a predetermined image process to image data input by said image input apparatus, on the basis of the processing setting information sent from said control means; and

data transfer means for establishing ring-like connection between said control means and said first image processing means, between said first image processing means and said second image processing means, and between said second image processing means and said control means, and unidirectionally transferring the setting processing information and the image data.

14. An apparatus according to Claim 13, wherein said second image processing means transfers the image data input by said image input apparatus to said control means on the basis of the processing setting information,

said control means stores the image data received from said second image processing means in said memory,

and transfers the image data in said memory to said first image processing means after storing the image data of a predetermined amount in said memory, and

said first image processing means outputs the image data received from said control means to said image output apparatus on the basis of the processing setting information.

15. An apparatus according to Claim 14, wherein

said image input apparatus is a scanner for inputting image data by reading an original image,

said image output apparatus is a printer for printing an image on a predetermined sheet on the basis of the image data, and

the processing setting information is the setting information for a copying process using said scanner and said printer.

16. An apparatus according to Claim 13, wherein said control means, said first image processing means and said second image processing means are composed respectively on different semiconductor substrates.

17. An apparatus according to Claim 13, wherein said data transfer means transfers the image data in unit of rectangular image data having a predetermined size.

18. An image input/output control apparatus comprising:

control means, connected to a memory for storing image data, for controlling input/output of the image data performed with an external apparatus;

first image processing means, connected to an image output apparatus, for performing a predetermined image process to image data to be output by said image output apparatus, on the basis of processing setting information sent from said control means;

second image processing means, connected to an image input apparatus, for performing a predetermined image process to image data input by said image input apparatus, on the basis of the processing setting information sent from said control means;

third image processing means for performing a predetermined conversion process to the input image data on the basis of the processing setting information sent from said control means; and

data transfer means for establishing ring-like connection between said control means and said first image processing means, between said first image processing means and said second image processing means, between said second image processing means and said third image processing means and between said third image processing means and said control means, and unidirectionally transferring the setting

processing information and the image data.

19. An apparatus according to Claim 18, wherein

said second image processing means transfers the image data input by said image input apparatus to said third image processing means on the basis of the processing setting information,

said third image processing means performs the predetermined conversion process to the image data received from said second image processing means and transfers the conversion-processed image data to said control means on the basis of the processing setting information,

said control means stores the image data received from said third image processing means in said memory, and transfers the image data in said memory to said first image processing means after storing the image data of a predetermined amount in said memory, and

said first image processing means outputs the image data received from said control means to said image output apparatus on the basis of the processing setting information.

20. An apparatus according to Claim 19, wherein

said image input apparatus is a scanner for inputting image data by reading an original image,

said image output apparatus is a printer for

printing an image on a predetermined sheet on the basis of the image data,

the predetermined conversion process in said third image processing means is a resolution conversion process, and

the processing setting information is the setting information for a magnification-change copying process using said scanner and said printer.

21. An apparatus according to Claim 18, wherein said control means, said first image processing means, said second image processing means and said third image processing means are composed respectively on different semiconductor substrates.

22. An apparatus according to Claim 18, wherein said data transfer means transfers the image data in unit of rectangular image data having a predetermined size.

23. A data communication apparatus which performs transmission/reception of a data packet composed of image data and a header including information concerning the image data, said apparatus comprising:

transmission means for transmitting the data packet; and

reception means for receiving the data packet

transmitted by said transmission means,

wherein said transmission means transmits, after transmitting the data packet, a footer including the same information as that of the header of the transmitted data packet, and

said reception means updates the information of the header on the basis of the received footer.

24. An apparatus according to Claim 23, further comprising notification means for notifying said reception means whether or not said transmission means transmits the footer,

wherein, if it is unnecessary to update the information of the header, said notification means notifies said reception means that said transmission means does not transmit the footer.

25. An apparatus according to Claim 23, wherein said reception means writes the received data packet in a predetermined memory, and, after receiving the footer, updates the information of the header by writing the information of the footer at an address where the header has been written.

26. An apparatus according to Claim 23, further comprising encoding means for encoding the image data of said data packet,

wherein said transmission means transmits the image data encoded by said encoding means.

27. An apparatus according to Claim 23, wherein the information included in the header represents an image data length.

28. A data communication apparatus which transmits a data packet composed of image data and a header including information concerning the image data to a predetermined memory, said apparatus comprising:

transmission means for transmitting the data packet to said predetermined memory; and

notification means for notifying said predetermined memory whether or not said transmission means transmits a footer,

wherein, in a case where the content of the header is not yet determined when the data packet is transmitted by said transmission means, said notification means notifies said memory that the image data transmission ends when the last image data is transmitted, and

said transmission means transmits, after the notification by said notification means ended, the footer including information to update the information of the header stored in said predetermined memory.

(29) A data communication apparatus which can communicate with plural image processing apparatuses performing image processes of a data packet composed of image data and a header including information concerning the image data, and performs communication using said data packet among said plural image processing apparatuses, said data communication apparatus comprising:

transfer means for transferring said data packet from the image processing apparatus on a transmission side to the image processing apparatus on a reception side; and

setting means for setting either a compression mode or a non-compression mode to the image processing apparatus on the transmission side,

wherein, in a case where the compression mode is set to the image processing apparatus on the transmission side by said setting means, said transfer means transfers information representing transmission of a footer to the image processing apparatus on the reception side, and, after transmitting the data packet, transfers the footer including information to update the information of the header transferred to the image processing apparatus on the reception side.

(30) An image processing apparatus which performs an image process of a data packet composed of image

data and a header including information concerning the image data, said apparatus comprising:

encoding means for performing a predetermined encoding process to the image data;

memory control means for controlling writing of the image data in a memory; and

transfer means for transferring the data packet encoded by said encoding means to said memory control means,

wherein said transfer means transfers, after transferring the data packet, a footer including the same information as that of the header of the transferred data packet, and

said memory control means updates the information of the header on the basis of the received footer.

31. An image processing method in an image processing apparatus which includes plural image processing units for performing predetermined image processes to image data, said method comprising:

a first generation step of generating a command packet in which a header including discrimination information to discriminate to which of the plural image processing units processing setting should be performed is added to command data including processing information to perform the processing setting for the plural image processing units;

a packet transfer step of transferring the command packet among the plural image processing units; and

a first control step of analyzing, in the plural image processing units, a header of the command packet transferred in said packet transfer step and controlling the process concerning the transferred command packet on the basis of discrimination information described on the header.

32. A method according to Claim 31, wherein said first control step performs control so that said command packet is output from each image processing unit, if the discrimination information of said command packet is uncoincident with discrimination information of each image processing unit, and performs control so that internal processing setting is performed according to the command data of said command packet in each image processing unit, if the discrimination information of said command packet is coincident with the discrimination information of each image processing unit.

33. A method according to Claim 31, further comprising:

a second generation step of generating a data packet in which a header including discrimination information to discriminate by which of the plural

image processing units the process should be performed is added to rectangular image data having a predetermined size, said packet transfer step transferring said data packet among the plural image processing units; and

a second control step of analyzing, in the plural image processing units, a header of the data packet transferred in said packet transfer step, and controlling the process concerning the input data packet on the basis of discrimination information described on the header.

34. A method according to Claim 33, wherein said second control step performs control so that said data packet is output from each image processing unit, if the discrimination information of said data packet is uncoincident with discrimination information of each image processing unit, and performs control so that an internal process based on the rectangular image data of said data packet is performed, if the discrimination information of said data packet is coincident with the discrimination information of each image processing unit.

35. A method according to Claim 31, wherein the plural image processing units are connected like a ring, and said packet transfer step sequentially

performs the packet transfer along ring-like buses to each image processing unit.

36. A method according to Claim 31, wherein said plural image processing units connect with an external apparatus and perform input/output of image data with the external apparatus on the basis of the processing setting in said first control step.

37. An image processing method in an image input/output control apparatus which includes a control unit, connected to a memory for storing image data, for controlling input/output of the image data performed with an external apparatus, a first image processing unit connected to an image output apparatus, and a second image processing unit connected to an image input apparatus, said method comprising:

a data transfer step of establishing ring-like connection between the control unit and the first image processing unit, between the first image processing unit and the second image processing unit, and between the second image processing unit and the control unit, and unidirectionally transferring processing setting information and the image data;

an input image processing step of performing, in the second image processing unit, a predetermined image process to the image data input by the image input

apparatus, on the basis of the processing setting information sent from the control unit; and

an output image processing step of performing, in the first image processing unit, a predetermined image process to the image data to be output by the image output apparatus, on the basis of the processing setting information sent from the control unit.

38. A method according to Claim 37, wherein

said input image processing step transmits the image data input by the image input apparatus from the second image processing unit to the control unit on the basis of the processing setting information,

the control unit stores the image data received from the second image processing unit in the memory, and transmits the image data in the memory to the first image processing unit after storing the image data of a predetermined amount in the memory, and

said output image processing step outputs the image data received from the control unit, from the first image processing unit to the image output apparatus on the basis of the processing setting information.

39. A method according to Claim 38, wherein

the image input apparatus is a scanner for inputting image data by reading an original image,

the image output apparatus is a printer for printing an image on a predetermined sheet on the basis of the image data, and

the processing setting information is the setting information for a copying process using the scanner and the printer.

40. A method according to Claim 37, wherein the control unit, the first image processing unit and the second image processing unit are composed respectively on different semiconductor substrates.

41. A method according to Claim 37, wherein said data transfer step transfers the image data in unit of rectangular image data having a predetermined size.

42. An image processing method in an image input/output control apparatus which includes a control unit, connected to a memory for storing image data, for controlling input/output of the image data performed with an external apparatus, a first image processing unit connected to an image output apparatus, a second image processing unit connected to an image input apparatus, and a third image processing unit, said method comprising:

a data transfer step of establishing ring-like connection between the control unit and the first image

processing unit, between the first image processing unit and the second image processing unit, between the second image processing unit and the third image processing unit, and between the third image processing unit and the control unit, and unidirectionally transferring processing setting information and the image data;

an input image processing step of performing, in the second image processing unit, a predetermined image process to the image data input by the image input apparatus, on the basis of the processing setting information sent from the control unit;

a conversion processing step of performing, in the third image processing unit, a predetermined conversion process to the input image data on the basis of the processing setting information sent from the control unit; and

an output image processing step of performing, in the first image processing unit, a predetermined image process to the image data to be output by the image output apparatus, on the basis of the processing setting information sent from the control unit.

43. A method according to Claim 42, wherein said input image processing step transmits the image data input by the image input apparatus from the second image processing unit to the third image

processing unit on the basis of the processing setting information,

said conversion step performs the predetermined conversion process to the image data received from the second image processing unit and transmitting the conversion-processed image data from the second image processing unit to the control unit, on the basis of the processing setting information,

the control unit stores the image data received from the third image processing unit in the memory, and transmits the image data in the memory to the first image processing unit after storing the image data of a predetermined amount in the memory, and

said output image processing step outputs the image data received from the control unit, from the first image processing unit to the image output apparatus on the basis of the processing setting information.

44. A method according to Claim 42, wherein

the image input apparatus is a scanner for inputting image data by reading an original image,

the image output apparatus is a printer for printing an image on a predetermined sheet on the basis of the image data,

the predetermined conversion process in the third image processing unit is a resolution conversion

process, and

the processing setting information is the setting information for a magnification-change copying process using the scanner and the printer.

45. A method according to Claim 42, wherein the control unit, the first image processing unit, the second image processing unit and the third image processing unit are composed respectively on different semiconductor substrates.

46. A method according to Claim 42, wherein said data transfer step transfers the image data in unit of rectangular image data having a predetermined size.

47. A data communication method which performs, among plural units, transmission/reception of a data packet composed of image data and a header including information concerning the image data, said method comprising:

a transmission step of transmitting the data packet from a transmission-side unit; and

a reception step of receiving the data packet transmitted in said transmission step, by a reception-side unit,

wherein said transmission step transmits, after transmitting the data packet, a footer including the

same information as that of the header of the transmitted data packet, and

said reception step updates the information of the header on the basis of the received footer.

48. A method according to Claim 47, further comprising a notification step of notifying the reception-side unit whether or not said transmission step transmits the footer,

wherein, if it is unnecessary to update the information of the header, said notification step notifies the reception-side unit that the footer is not transmitted.

49. A method according to Claim 47, wherein said reception step writes the received data packet in a predetermined memory, and, after receiving the footer, updates the information of the header by writing the information of the footer at an address where the header has been written.

50. A method according to Claim 47, further comprising an encoding step of encoding the image data of said data packet,

wherein said transmission step transmits the image data encoded in said encoding step.

51. A method according to Claim 47, wherein the information included in the header represents an image data length.

52. A data communication method which transmits a data packet composed of image data and a header including information concerning the image data to a predetermined memory, said method comprising:

a transmission step of transmitting the data packet to the predetermined memory; and

a notification step of notifying the predetermined memory whether or not said transmission step transmits a footer,

wherein, in a case where the content of the header is not yet determined when the data packet is transmitted in said transmission step, said notification step notifies the memory that the image data transmission ends when the last image data is transmitted, and

said transmission step transmits, after the notification in said notification step ended, the footer including information to update the information of the header stored in the predetermined memory.

53. A data communication method which perform communication using a data packet composed of image data and a header including information concerning the

image data, among plural image processing apparatuses performing image processes of the data packet, said method comprising:

a transfer step of transferring said data packet from the image processing apparatus on a transmission side to the image processing apparatus on a reception side; and

a setting step of setting either a compression mode or a non-compression mode to the image processing apparatus on the transmission side,

wherein, in a case where the compression mode is set to the image processing apparatus on the transmission side in said setting step, said transfer step transfers information representing transmission of a footer to the image processing apparatus on the reception side, and, after transmitting the data packet, transfers the footer including information to update the information of the header transferred to the image processing apparatus on the reception side.

54. A data communication method in an image processing apparatus which performs an image process of a data packet composed of image data and a header including information concerning the image data, said method comprising:

an encoding step of performing a predetermined encoding process to the image data;

a transfer step of transferring the data packet encoded in said encoding step to a memory;

a memory control step of controlling writing of the image data in the memory,

wherein said transfer step transfers, after transferring the data packet, a footer including the same information as that of the header of the transferred data packet, and

said memory control step updates the information of the header on the basis of the received footer.